

**REMARKS**

Claims 1 and 3-7 are pending in the application. Claim 6 was objected to because of a perceived informality. Claims 1, 3, 4, 6 and 7 were rejected under 35 U.S.C. §102(b) as being anticipated by Berman. Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Coffey.

The Applicants note that the Office Action mailed on May 3, 2006 suggests that certain claim amendments in the response filed on February 7, 2006 were either not entered, or were inadvertently not considered in the preparation of the Office Action. For example, the claim language quoted during the discussion of the rejection of claim 1 *does not reflect any of the amendments made to claim 1* in the response filed on February 7, 2006. In addition, the claim language quoted during the discussion of the rejection of claim 3 *reflects some, but not all of the amendments made to claim 3* in the response filed on February 7, 2006.

In view of this, the Applicants respectfully request an evaluation of whether the non-final Office Action should be withdrawn in favor of a substitute non-final Office Action that takes into consideration all claim amendments that were filed on February 7, 2006 (along with an RCE).

However, in case it is determined that a substitute non-final Office Action is not necessary or required, the Applicants have prepared the following response to the non-final Office Action in which claim 3 has been amended. Reexamination and reconsideration of the application in view of the amendments and following remarks is respectfully requested. .

**Claim 6 was objected to because of a perceived informality.** In particular, the Examiner suggested that the "second Arbitrated Loop device" should be amended to "the first Arbitrated Loop device." The Applicants thank the Examiner for his suggestion. However, if the suggested amendment to claim 6 was made, "the first Arbitrated Loop device" would lack antecedent basis in claim 3 (as amended in the response filed on February 7, 2006). Instead, to correct the informality, line 4 of claim 3 has been amended to recite "a second Arbitrated Loop device," and line 22 has been amended to essentially undo the previous amendment and recite "the

second Arbitrated Loop device." With these amendments to claim 3, it is respectfully submitted that the objection to claim 6 has been overcome.

**Claims 1, 3, 4, 6 and 7 were rejected under 35 U.S.C. §102(b) as being anticipated by Berman.** The Applicants respectfully traverse this rejection.

Claim 1 includes the limitation "wherein the crossbar switch creates the direct paths between the first and second ports based on the *OPN arbitrated loop primitives*" (emphasis added).

However, Berman contains no disclosure at all related to a crossbar switch that creates paths between ports based on *arbitrated loop primitives*, as recited in claim 1. Berman is fundamentally different from the invention of claim 1, because whereas the recitation of "based on arbitrated loop primitives" means that the crossbar switch routes based on *arbitrated loop primitives*, Berman discloses a crossbar switch that routes based on *frames*.

The invention of Berman clearly routes based on *frames*. See, e.g., col. 11, lines 45-58 ("The fabric Port Control Modules (PCM) . . . receive Fibre Channel *frames* . . . [and] send a route request to the router"), col. 12 lines 20-21 ("The Router connects and disconnects routes on a *frame by frame* basis"), and col. 13 lines 7-9 ("The Address Table [in the fabric router of FIG. 16] contains entries against which the incoming Fibre Channel *frame* destination identifier (D\_ID) is compared"). (Emphasis added.)

Furthermore, the difference between primitives and frames is significant, non-trivial and well-understood by those skilled in the art. For example, the Fibre Channel Arbitrated Loop (FC-AL-2) specification, Rev. 6.1, February 16, 1998, defines FC-AL and how it differs from higher

level Fibre Channel protocols (e.g., *frame* level 2).<sup>1</sup> The FC-AL-2 specification describes the difference between processing loop protocol primitives and the FC-PH framing protocol.<sup>2</sup>

Nevertheless, the Office Action states that the claim 1 limitation "wherein the crossbar switch creates the direct paths between the ports based on the OPN arbitrated loop primitives"<sup>3</sup> is disclosed in Berman. In particular, the Office Action states that this limitation is disclosed in Berman because Berman discloses that the fabric routes *frames* from PCM module 451 to Brouter module 455 or another PCM module (col. 11 lines 30-58 of Berman) based on the OPN primitives such as OPNs (col. 20 lines 40-55 of Berman). However, the Applicants respectfully submit that this reflects a misunderstanding of the differences between primitives and frames, as discussed above. The fact that Berman discloses that the fabric routes *frames* is precisely why Berman does not disclose, teach or suggest routing based on OPN arbitrated loop *primitives*. As noted above, these schemes operate at completely different levels. The invention of claim 1 forwards primitives to the router, which then causes the crossbar switch to create direct paths between ports. In contrast, Berman strips off the primitives before sending a frame to the router.

In addition, although the Office Action refers to col. 20 lines 40-55 of Berman in support of its position that Berman discloses routing between ports based on loop primitives, those lines only disclose a "Loop Port State Machine including[:] an active L-Port, implementing the Fibre Channel Arbitrated Loop protocol, including the generation of ARBs, OPNs and Closes . . . [for] *providing point to point connection between the first loop port state machine and a provide loop device in the first Arbitrated Loop.*" As mentioned above, Berman strips primitives off at the ingress Port Control Module (PCM), only routing frames through the fabric. The re-generation of ARBs, OPNs and Closes (CLSS) by the egress PCM is to maintain the FC-AL protocol as data is transmitted to *externally attached devices*, not between two ports.

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<sup>1</sup> Figure 2 of the FC-AL-2 specification shows the difference between FC-AL and FC-2 (the signaling or frame protocol).

<sup>2</sup> See, e.g., p. 7 of the FC-AL-2 specification ("Unlike the Fabric topology where a circuit is established only for a dedicated connection or virtual circuit, a Loop circuit must be established between two L\_Ports on the Loop before the FC-PH framing protocol may be used.").

Because Berman does not disclose all of the limitations of claim 1, it is respectfully submitted that the rejection of claim 1 under 35 U.S.C. §102(b) as being anticipated by Berman has been traversed.

Claim 3 is similar to claim 1 in that it includes the limitation "route determination apparatus . . . for selecting a direct route between the first and second ports based on received *Fibre Channel Arbitrated Loop primitives*" (emphasis added).

However, Berman does not disclose, teach or suggest a route determination apparatus that selects a direct route between ports based on *arbitrated loop primitives*, as recited in claim 3. For the same reasons given above with respect to claim 1, Berman is fundamentally different from the invention of claim 3, because whereas the recitation of "arbitrated loop primitives" means that the route determination apparatus routes based on *arbitrated loop primitives*, Berman discloses a crossbar switch that routes based on *frames*.

Nevertheless, the Office Action states that the claim 3 limitation "route determination apparatus . . . for selecting a direct route between the first and second ports based on received Fibre Channel Arbitrated Loop primitives" is disclosed in Berman. In particular, the Office Action states that this limitation is disclosed in Berman because Berman discloses routing based on the OPN primitives such as OPNs (col. 20 lines 40-55 of Berman). However, as mentioned above, Berman strips primitives off at the ingress Port Control Module (PCM), only routing frames through the fabric. The re-generation of ARBs, OPNs and Closes (CLSs) by the egress PCM is to maintain the FC-AL protocol as data is transmitted to *externally attached devices*, not between two ports.

Because Berman does not disclose all of the limitations of claim 3, it is respectfully submitted that the rejection of claim 3 under 35 U.S.C. §102(b) as being anticipated by Berman has been traversed. Furthermore, because claims 4, 6 and 7 depend from claim 3, it is respectfully

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<sup>3</sup> The Applicants note that this limitation, as amended in the response filed on February 7, 2006, reads "wherein the crossbar switch creates the direct paths between the first and second ports based on the OPN arbitrated loop primitives."

submitted that the rejection of those claims has been traversed for the same reasons provided above with respect to claim 3.

**Claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Coffey.** Claim 5 depends from claim 3. This rejection is respectfully traversed.

As discussed above, Berman does not disclose, teach or suggest a "route determination apparatus . . . for selecting a direct route between the first and second ports based on received Fibre Channel Arbitrated Loop primitives" as recited in claim 3.

Coffey fails to make up for the deficiencies of Berman in this regard. The route determination apparatus as recited in claim 3 selects a *direct route* between two ports *based on received arbitrated loop primitives*. In other words, a *direct route* is selected *when the arbitrated loop primitives are received*. In contrast, Coffey uses a Cross-Point Switch (CPS) to make connections between adjacent ports to form a loop *during initialization*, not when OPN primitives are received (see Figure 4 and paragraph [0104] of Coffey). Subsequent to the formation of the loop, Coffey uses OPN ordered sets to form a loop circuit between originator and destination ports (see paragraph [0068] of Coffey). However, this loop circuit does not represent a direct route, because the path between originator and destination ports passes through any intervening ports in the loop.

The Office Action states that Coffey discloses an OPN primitive for opening a connection between two ports. While this is true, the Applicants respectfully submit that this statement reflects a misunderstanding of the differences between the creation of a *direct route* and the creation of a *connection*, which is misleadingly characterized in paragraph [0068] of Coffey as essentially creating "a point to point connection." In fact, the connection formed by Coffey is not a point to point connection at all, but rather a loop circuit between originator and destination ports within a *pre-existing loop* that must pass through all intervening ports. Coffey acknowledges as much: "All other devices in the loop between the originator and the responder device simply repeat the data" (paragraph [0068]).

Therefore, even if one skilled in the art would have been motivated to combine Berman and Coffey, neither Berman nor Coffey, alone or in combination, discloses, teaches or suggests all of the limitations of claim 3, and therefore does not disclose, teach or suggest all of the limitations of claim 5, which depends from claim 3.

Because neither Berman nor Coffey, alone or in combination, discloses, teaches or suggests all of the limitations of claim 5, it is respectfully submitted that the rejection of claim 5 under 35 U.S.C. §103(a) as being unpatentable over Berman in view of Coffey has been traversed.


In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

If, for any reason, the Examiner finds the application other than in condition for allowance, Applicants request that the Examiner contact the undersigned attorney at the Los Angeles telephone number (213) 892-5752 to discuss any steps necessary to place the application in condition for allowance.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Docket No. 491442011620.

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Respectfully submitted,

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